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GEOGRAPHIC SCHOOL BULLETINS

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Dorothy Hosmer

ALL EYES AND EARS ARE ALERT AT DODECANESE LISTENING POSTS

The Dodecanese Islands in the Aegean, between Turkey and Greece, give Allied forces new sentry outposts from which to test when conditions may be ripe for invasion. The easternmost, Castelrosso, has facilities for monitoring enemy broadcasts. Only one mile off Turkey's coast, Castelrosso costume shows Turkish influence. Over her traditional pillbox headdress the Castelrosso matron (above) wears, in lieu of a veil, a big embroidered scarf which can cover her face. Her ears are pierced in three places for her heirloom jewelry of antique gold coins; two silk cords suspend one earring (Bulletin No. 4).

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GEOGRAPHIC SCHOOL BULLETIN

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Originally entered as second-class matter January 27, 1922; re-entered as of April 27, 1943, Post Office, Washington, D. C., under Act of March 3, 1879. Copyright, 1943, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

Russian Drive Frees the Rich Ukraine

THE triumphant westward surge of the Red Army in the south is cleaning out the Nazi invaders from the Ukraine, whose rich resources of farm, factory, and mine once contributed heavily to Soviet strength. A pre-invasion portrait of the region before war wrecked it can suggest its potential riches.

The Ukraine is one of the main republics (called Constituent Republics) that are joined together to make up the U.S.S.R. (Union of Soviet Socialist Republics). It occupies the Soviet Union's southwest corner, reaching to the frontiers of Romania and Poland. Up to 1939 its area was 170,000 square miles. Districts of Poland and Romania annexed to it in 1939 and 1940 brought its area to about 220,000 square miles. That is a greater area than Germany had in 1937.

Had 40 Million People in Sugar Bowl-Bread Basket

In this extended Ukraine lived more than 40 million people, nearly a third as many as live in the United States.

The great majority of the Ukrainians made their living from the soil. Because of the rich yield of grains, the region has long been called Russia's bread basket. It also should be called Russia's sugar bowl.

Across the Ukraine spreads a wide belt of good "black earth," like that of central Texas. This belt produced about three-fourths of the Soviet Union's sugar beets; a third of its barley; a fourth of its corn; a fifth of its wheat.

Potatoes, pumpkins, squash, melons, and fruits flourished in the gardens and orchards. Some 40 per cent of the U.S.S.R.'s eggs came from Ukrainian barnyards, and the region raised nearly a quarter of the nation's livestock.

Rolling away toward distant horizons, vast fields were given over to grasses 10 or 20 feet high, used for fodder and fuel or for making rope and coarse cloth. Sunflowers contributed fodder and an oil pressed from their seeds. Cotton plantations covered more than half a million acres.

Soviet Reservoir of Coal, Iron, and Manganese

Climate in the Ukraine is of the type called "continental"—extremely cold in winter, scorching in summer. Weather there is much like that in northern sections of the American prairie West, whose gently rolling open spaces the Soviet region resembles. Unlike the frame farmhouses of America, the typical Ukrainian dwelling is plastered, whitewashed, and topped by a high thatched roof.

The first tractor stations of the Soviet Union were in the Ukraine, where, by 1939, some 90,000 tractors and 20,000 harvesters were at work. More than 95 per cent of the peasant householders participated in "collective farming" (operation of farms by the state or by co-operative groups of farmers).

Although mainly agricultural, the Ukraine became also a mining and manufacturing region, the southern center of Soviet heavy industry. It produced three-quarters of the Soviet Union's coal and more than half of its iron and steel. Seventy per cent of all Russian agricultural machinery was made in the Ukraine.

Deposits of iron and manganese ore and coal close together were the basis of this industrial development. The largest iron deposits, among the world's richest, lie near Krivoi Rog, the iron industry capital.

Coal for smelters, rolling mills, locomotives, and factories of the south U.S.S.R. came from the Donets Coal Basin north of Rostov. Deposits of Donets

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Mrs. Branson De Cou

SPIRALING DRAGONS, NOT BULLS AND BEARS, GUARD DENMARK'S WALL STREET

Copenhagen, largest Baltic port, is a city of spires and towers, of carved stone bridges over water highways, vaguely Venetian. The motor boat streaking white chevrons across the canal carries its passengers past the Royal Stock Exchange (right). Bulls and bears may be associated with stock exchanges of other countries, but four green copper dragons which might well have slithered from one of Hans Andersen's stories guard this imposing 17th-century building. Their slim tails spiral to a point on which a string of globes is balanced against the sky. To the left rises the highest church spire in Denmark—that of the Church of Our Saviour—around which a staircase winds in four turns to the gilded top (Bulletin No. 3).

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Sardinia Gave Italy Silver, Coal, and Kings

THE ripe-plum island of Sardinia, that fell into Allied hands after Sicily had been plucked from the Axis, offers a fine spearhead for attack against northern Italy. Its position is reinforced by Corsica, French recaptured island only eight miles to the north. The industrial cities of northern Italy are closer to Sardinia than to Allied bases in southern Italy itself.

The rugged rectangle of Sardinia, about New Hampshire's size, stands in the middle of the Mediterranean's western basin. Only 120 miles south lies Tunisia; 120 miles east, Italy; 170 miles north, France; 255 miles west, Spain's Balearic Islands.

Exiles Once Condemned to Its African Climate

Aside from its value for bases, Sardinia has supplied the Axis with dairy products and war-important minerals the loss of which will be weakening. Coal—both anthracite and lignite—iron, lead, zinc, and silver occur there.

The island, 166 miles long and half as wide, has only a million people, most of them country dwellers. (Sicily, little larger, has four times that population.) Since few sea routes touch its shores and few people inhabit its poor mountains, Sardinia is a lonely island.

As to climate, the land of the Sards is a chip off the old block of North Africa—hot and dry. In vegetation, too, the island mirrors the Mediterranean's south shores—palm trees, prickly pear cactus, olive groves, and cork trees. Roses, heliotrope, and geraniums bloom in winter and spring, but wither when summer brings the parching winds that blow from the south.

Rainless summers and tangled mountain systems deprive Sardinia of navigable rivers. The largest is the Tirso, barely 93 miles long. Its 230-foot-high dam backed up an artificial lake 13 miles long until bombed by United Nations flyers.

Until modern drainage measures were started, the marshy coasts of Sardinia were malaria infested. Roman rulers punished enemies by exiling them to Sardinia to die. Drainage of marshes made possible the new town of Mussolinia.

Slaves Mined Silver, Farmers Fed Romans

The east coast is a steep wall with few breaks for harbors except at Terranova in the north, the port of entry for the steamship line from Italy. The eastern half of the island is a mass of steep mountains, where shepherds tend their goats, sheep, and cattle. In the northeast are cork forests. Barren highland towns, like Tempio, dry slabs of cork (illustration, next page) and make bottle stoppers. The rugged southeast corner has silver mines.

The western half, studded with high tablelands and the knobs of extinct volcanoes, has abundant harbors and fertile volcanic soil. It has most of the towns, ports, farms, minerals, railroads, and highways.

Best and most historic port is Cagliari, the capital city, which dominates the island's southeast end. Until recent bombings, between 80,000 and 100,000 people lived there, or about 10 per cent of Sardinia's inhabitants.

From Cagliari can be seen the 15-mile-wide Campidano plain that runs like a corridor for 60 miles cater-cornered across the island to the Gulf of Oristano. This plain supplied wheat to ancient Rome. It still yields wheat, as well as carrots, peppers, onions, artichokes, and white and purple cauliflowers.

Bulletin No. 2, October 1, 1943.

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coal, largely anthracite, have been estimated at about 55 billion tons.

Great deposits of manganese (vital in hardening steel) lie southeast of Krivoi Rog. Ukraine mines, plus others in the Caucasus, have provided a third of the world's output of manganese. A third of the manganese imported by the United States normally came from Russia. Other Ukrainian minerals are mercury, lead, zinc, gold, salt, and lignite.

The huge hydroelectric development at the Dneprostroy Dam on the Dnepr (Dnieper) River, before it was wrecked, produced more than half a million kilowatts of electricity, most of it used in near-by chemical or metals plants.

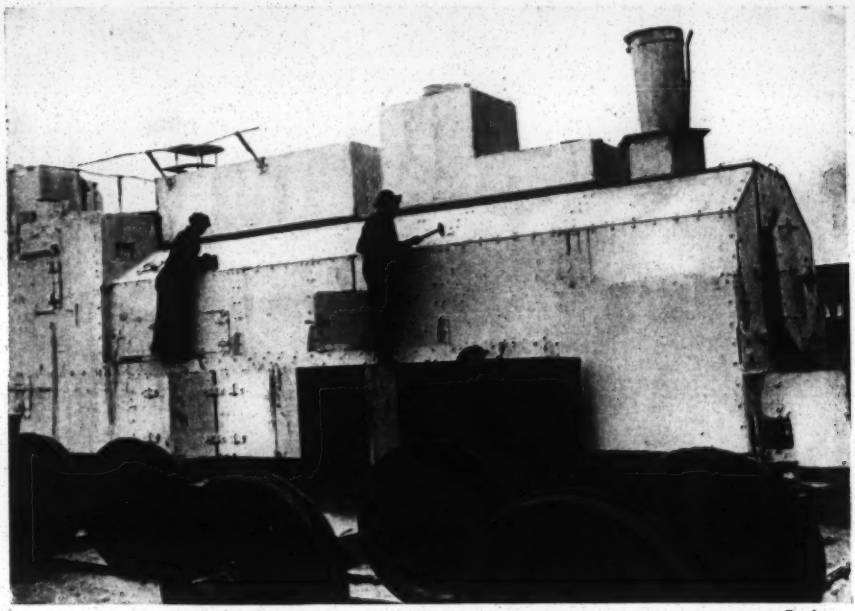
The Pittsburgh-like mill-and-mine area of the central Ukraine made up the largest industrial concentration in the U.S.S.R. There the large cities, such as Kiev, Kharkov, Dnepropetrovsk, Zaporozhe, Stalino, Nikolaev, and Voroshilovgrad turned out iron and steel, aluminum and magnesium, tractors, combines, and other farm machinery, turbo-generators, and locomotives. Railroads of the Ukraine handled more freight than those of any other Soviet republic.

Note: The U.S.S.R. is shown on the National Geographic Society's Map of Europe and the Near East. A price list of maps may be obtained from the Society's headquarters in Washington, D. C.

For additional information about the U.S.S.R., see these articles in the *National Geographic Magazine:* "Valiant Russia's Industrial Might," May, 1943; "Mother Volga Defends Her Own," December, 1942; and "Roaming Russia's Caucasus," July, 1942*. *(Issues marked with an asterisk are included in a special list of Magazines available to teachers at 10¢ a copy in groups of 10.)*

See also these GEOGRAPHIC SCHOOL BULLETINS: "The Dnepr Line a Russian Battlefront Again," March 15, 1943; and "Kharkov, Hub of Ukrainian Activity," March 1, 1943.

Bulletin No. 1, October 11, 1943



Sovfoto

GHOST TRAINS FROM THE UKRAINE CARRY A HEAVY LOAD OF DANGER

Locomotive works in the Ukraine, using iron and steel from Ukrainian mills, turned out a considerable portion of the U.S.S.R.'s railroad trains before the Nazis occupied this rich southwestern region. Much of the equipment was moved to industrial centers farther east to save it from capture. The photograph shows young workers in their spare time building an armored train to be turned over as a gift to the Red Army. The armor plate is painted white for camouflage in winter fighting. Such ghostly armored trains, a specialty of the Russians, stand a chance of rushing men or supplies safely past enemy positions.

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Defiant Denmark: Land of Forward-Looking Farmers

DENMARK, the small kingdom directly across the North Sea from England, spoke for all the restive, captive countries under German occupation when it briefly rebelled last month.

The little country that defiantly kicked the shins of the Nazi colossus is about half the size of Indiana. In topography and land use it resembles Delaware. It is sandy seaside country with no mountains and few rivers.

It lives by raising crops which can be exported easily and profitably. Peacetime Denmark had half the world export trade in bacon and hams, one-fourth that in butter and eggs. Exported Danish butter would have been enough to supply all of New York City, and Hoboken and Jersey City as well. Egg exports would suffice for more than half the same population.

Before the war, the entire country was virtually one large dairy and produce farm for supplying English tables. Refrigerator boats carried Danish bacon, butter, eggs, and hams to Harwich in 18 hours.

Farms on Three Acres out of Four

Three out of four acres in Denmark are under cultivation. Each farm exported annually an average of $1,200 worth of agricultural products.

Since the war, the country has drawn anxious attention as a possible landing spot for a second front. Denmark's mainland peninsula, Jutland, adjoins Germany. Its North Sea coast is a nearly continuous exposed sandy beach. Inland lie a few miles of sand dunes, then open rolling farmlands stretching eastward to the Baltic and southward to the German frontier.

Denmark is one of the world's leading shipbuilding nations. It developed the ocean-going motorship; built nearly half the world's marine Diesel motors.

With no minerals and no water power, Denmark nevertheless has some industries. Clay and chalk on the east coast of Jutland provide materials for a large cement industry. Cement-making machinery for 700 plants scattered over the world was manufactured in Denmark. Pottery and china are other products.

Capital Holds One-Fifth of People

Once a power which at times controlled all of Scandinavia and even England, Denmark in modern times has pursued a peaceable, progressive course politically, with an emphasis on co-operatives. The country pioneered in social security, education (illustration, next page), old age pensions, unemployment insurance, and health legislation for its 3,800,000 people.

One-fifth of the nation's inhabitants live in the capital city, Copenhagen (Kobenhavn to the Danes). On the same scale, Washington, D. C., would have more than 26,000,000 people.

Copenhagen is a city of wide streets and open spaces, parks and lagoons; trees, towers, bronze and copper spires (illustration, inside cover). Buildings are mostly of stone or brick; a wooden Copenhagen once burned down. It is thus not an old city but modern, almost ultra-modern in parts.

Situated on an island, Copenhagen occupies a smaller area than most other cities of its size. Nine-tenths of its residents live in apartment houses. This has been given as the reason why Copenhagen normally spends more on amusements than other cities of its size in Europe. It supports numerous cafes, music halls,

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Sardinia's other sizable stretch of plain, in the north, curves around the next largest city, Sassari, about half the size of Cagliari. The Sassari plain is dotted with gray-green tufts of olive and orange trees, and striped with purple-green rows of vineyards. Small Porto Torres is the port for Sassari.

Sardinia's rich mining district, known as the Iglesiente, comprises almost the whole southwest corner of the island. Slaves worked mines in the Iglesiente for the Romans. Lead, silver, and zinc still are produced. The town of Iglesias, with about 11,000 people, is the center for the district.

That these riches invited invasion even before history began is shown by peculiar flat-topped stone towers—some of them 60 feet high—which prehistoric Sardinians built as their Bronze Age Maginot Line to guard the mountain passes.

When ancient Carthage tried to conquer the world, her brood of supermen reached for Sardinia about 500 B.C. Rome snatched it away in 238 B.C.

Vandals from Africa in 456 A.D. ended Rome's 700 years of undisputed power. Then Saracens made Sardinia a base for raids on Italy. The merchant cities of Pisa and Genoa made it an outpost to protect their ships from Moslem pirates. The island belonged to Spanish, British, and Austrian rulers before it was ruled from Rome again. In 1720 Austria swapped Sardinia for Sicily with the Dukes of Savoy, who thereafter called themselves Kings of Sardinia. In 1861 the Savoys gained ascendancy over the half-dozen other crowned heads ruling Italian states, and Sardinia's king was allowed to ascend the throne of united Italy.

Note: Sardinia may be located on the National Geographic Society's Map of Europe and the Near East, and the Map of Classical Lands of the Mediterranean.

For additional information, see "Where the Sard Holds Sway," in the *National Geographic Magazine*, April, 1926. See also these GEOGRAPHIC SCHOOL BULLETINS: "Sardinia, a First Step from Tunisia," May 3, 1943; and "Sardinia, Coal Source for Fuel-Hungry Italy," February 6, 1939.

Bulletin No. 2, October 11, 1943 (over).

Clifton Adams

BARK UP THE RIGHT TREE IN SARDINIA AND YOU GET CORK

Similar in climate, Sardinia resembles North Africa also in having some cork-oak forests. In the island's rocky northeast corner, one of the few things that thrive is the oak. Widely spaced across the landscape the cork-oak stands out, a red-brown column stripped smooth of bark from root to branches. At villages like Aggius, overshadowed by the sawtoothed profile of mountain ranges (background), slabs of the bark are stacked up on rocky hillsides to dry in the sun. Aggius is typical of Sardinia, where most people live in stone-fenced towns of fewer than 5,000. When dry, the bark is taken to a larger town, usually to Tempio, where sharp-bladed machines cut it up into bottle stoppers.

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Dodecanese Knew War's Havoc, Medicine's Healing

ITALY'S surrender opened a new chapter in the history of the Dodecanese Islands, a cluster of gem-green spots set in the blue Aegean Sea.

Promptly after the surrender the Greek Government-in-Exile at Cairo filed a claim to the islands and demanded that defeated Italians renounce all rights. Meanwhile, closing in on southern Europe from the east, Allied forces from the Middle East moved over to take some of the islands, notably Cos (Coo), Leros (Lero), and Castelrosso (illustration, cover).

Geographically closest to Turkey; overwhelmingly Greek in population and traditions; captured by Italy in 1912; ceded to Greece by a 1919 treaty which the Italians renounced in 1922; Italian-held until they came under Nazi "protection" after the fall of Greece and before the invasion of Crete in 1941—these are the bare facts in a summary of the modern adventures of a now obscure island group once highly important in the civilization of ancient Europe.

Dodecanese Dozen, Like the Baker's, Is Thirteen

Their ancient name, remotely akin to "dozen," comes from the Greek for "twelve." But, like the baker's dozen, the assortment now governed as a group includes thirteen principal islands. On some maps they are called the Southern Sporades. The official Italian name is the Italian Islands of the Aegean.

Many of the Dodecanese thirteen lie in sight of the coast of Turkey. The outlying islets, however, reaching southwestward from one main island, Carpathos (Scarpanto), extend to within 30 miles of Crete, the largest island of Greece.

These rugged Aegean islands, the sites of numerous battles, are well equipped for the enjoyment of peace. Their mountain scenery and healthful climate attract peacetime tourists. Their fertile soil yields large crops of olives, figs, oranges, and lemons; excellent grapes and melons; good grain; and tobacco.

Gathering sponges from the waters of the Aegean is the distinctive occupation of most of their Greek population in times of peace.

Cos Took "Witch" Out of "Witch-Doctor"

Rhodes (Rodi), the southeastern anchor of the island cluster, is the largest and best known. The city of Rhodes, capital of the group under Italian rule, has been rapidly modernized. But it contains many solid old fortifications as relics of the Crusades and medieval battles (illustration, next page). No trace remains of the Colossus of Rhodes, statue which once towered 100 feet high at the harbor entrance and was one of the famous Seven Wonders of the World. An earthquake leveled it in 224 B.C.

The eight-mile-long island of Leros is near the northern end of the group. Its Greek name of Leros means "flat," a term it deserves only by comparison with its neighbors' loftier mountains. Its shoreline offers an excellent deep-water naval harbor at the town of Leros on the east coast, and large Lakki Bay on the southwest shore, almost landlocked, is the site of a modern naval base.

Cos, closest to Rhodes of the new Allied bases, has a harbor at Cos town on the eastern end of its 23-mile length. Birthplace of Hippocrates, "Father of Medicine," in 460 B.C., the island grew famous in Roman times as seat of a health resort and the first school of scientific medicine, practicing the teachings of Hippocrates. Under the influence of this teacher, medicine veered away from magic

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and theaters; it has its opera, year-round circus, and zoo. Twenty acres in the heart of the city are given over to a spacious amusement park.

Denmark's royal family occupy four palaces facing one another in an octagonal "square" in the docks area. The Rigsdag (or Parliament) and the Supreme Court sit in the modern Christiansborg Palace.

The chief port of food-exporting Denmark and of all Scandinavia, Copenhagen has the largest harbor on the Baltic, complete with shipbuilding works.

Copenhagen means "Merchants' Haven," and the city, a free port since 1894, has grown almost wholly by trade. It had its automobile assembly plant, piano factory, breweries, brickyards, and porcelain and pottery works.

Its army of workers take over the streets at opening and closing time on 400,000 bicycles. In addition, it has in peacetime the largest proportion of automobiles of any European city.

Note: Denmark is shown on the National Geographic Society's Map of Central Europe and the Mediterranean.

For further information about Denmark, see the following articles in the *National Geographic Magazine:* "On Danish By-Lanes," January, 1940*; and "Royal Copenhagen, Capital of a Farming Kingdom," February, 1932*. See also these GEOGRAPHIC SCHOOL BULLETINS: "Skagerrak and Kattegat: Embattled Channel Waters of Scandinavia," April 29, 1940; and "Denmark Makes an Industry of Farming," April 3, 1939.

Bulletin No. 3, October 11, 1943.

Jonals

OLD ENOUGH TO GO TO SCHOOL? NOT TILL YOU'RE EIGHTEEN

Widespread education long helped Denmark, one-third as large as New York State, to maintain itself as an independent nation among stronger neighbors, until the Nazi invasion. A type of school peculiar to the country is the Folk High School for adults, chiefly farm men and women. It is recognized that the young adult faces problems for which he as a child could not be taught the answers in advance. Solution: a small, low-cost boarding school where high school subjects are taught from the adult point of view. Before the Nazi invasion, about 60 of these schools existed, with 100 to 150 students each. The minimum age is 18. They are private schools, but the government helps with subsidies to the schools and scholarships to students. Usually men attend the five-month session in the winter, when farm chores are light, and women a three-month summer course, when household duties slacken. These young women (above) were studying the map of North America more seriously than any child, learning how Canada could affect the sale of their dairy products in England and how the United States might influence their chances of peace or war in Europe.

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Geo-Graphic Brevities

U. S. BOMBERS CHIPPED EDGE OF RISING SUN AT PARAMUSHIRO

THE base of Paramushiro, which American flyers have bombed on repeat raids over Japan's northern fringes, is a Japanese Attu. It is the tail end of the 700-mile chain of the Kurile Islands, geographical cousins of the Aleutians. Paramushiro is only 765 miles from Attu.

Called Chishima by the Japanese, the Kuriles stretch northeast from Hokkaido, northernmost of Japan's "mainland islands." There are more than thirty Kuriles, large and small. They are important for fisheries as well as their outpost position. Fish from northern seas is one of Japan's food staples.

Rugged Paramushiro is about 12 by 55 miles in area. Its mountains rise to peaks nearly 6,000 feet high. Often mountainsides slope directly into the sea.

Except at the military base, Paramushiro has no year-round inhabitants. In the summer fishermen from Hokkaido set up camps on all the northern Kuriles, where they process heavy catches of salmon and cod.

Only the small island of Shumushu and narrow, treacherous Chishima Strait separate Paramushiro from the Soviet Union's Kamchatka Peninsula. Mainland, islands, and seas in this region of the northern Pacific are nearly always fog-ridden, obscuring national boundaries. Navigation is risky. Birds—some flying 25 miles from shore—often are the first warning of land beyond the curtain of fog.

By 1875 both Russia and Japan were claiming the Kuriles and the island of Sakhalin as well. Russia withdrew from the Kuriles with the understanding that Japan would give up all claim to Sakhalin. Japan kept all the Kuriles and subsequently took half of Sakhalin in the Russo-Japanese War.

NOTE: Paramushiro is shown on a large-scale inset on the National Geographic Society's New Map of the Pacific Ocean and the Bay of Bengal, which was issued as a supplement to the September, 1943, number of the *National Geographic Magazine*.

THIS IS THE "WAR OF EXPLOSIVES"

BUYERS of War Bonds and Stamps, reflecting on the incalculable cost of war, can charge a lot of it up to explosives.

Never before, since the Byzantines used "Greek Fire" in defense of Constantinople in 673, or since the first handful of crude cannon boomed in the Battle of Crécy in France, in 1346, has the world seen such a prodigal use of explosives as in this war.

Automatic rifles shoot faster than ever before and require more bullets per minute. Machine guns are bigger and better—and hungrier for ammunition. As many as eight machine guns are mounted on a single fighter plane to send a veritable cutting edge of bullets at the enemy. One type of fighter carries in addition four cannons, ranging up to 37 millimeters in bore; the largest can shoot 85 one-pound shells a minute.

Quick-firing antiaircraft guns on land and on ships throw up sheets of "flak" that cover large areas of the sky. Other tons of explosives must supply the guns and cannon of tanks, the mortars and field guns, the land mines, sea mines, depth charges (illustration, next page), and torpedoes.

Most spectacular and most destructive use of explosives is aerial bombing. More than 2,000 tons of bombs may be dropped upon a city in less than an hour. A single bomb of the giant block-buster type weighs 8,000 pounds.

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and witch-doctoring and became concerned with a scientific study of the reaction of the body to given conditions. Thus the island shares a common source of fame with the embattled city of Salerno in Italy. From the 10th to the early 19th century Salerno was renowned throughout Europe for its medical college and health center, in which the scientific theories of Hippocrates were reborn.

Other main islands of the group are Patmos (Patmo), isle of banishment of St. John the Evangelist; Simi and Stampalia, centers for sponges; Kasos (Caso), locally known for its butter; Kalymnos (Calino), famous for honey; Nisiro, Piscopi, and Calchi.

Note: The Dodecanese Islands are shown on the National Geographic Society's Map of Central Europe and the Mediterranean.

See also: "Rhodes, and Italy's Aegean Islands," in the *National Geographic Magazine*, April, 1941*. See the GEOGRAPHIC SCHOOL BULLETINS, January 6, 1941: "Italy's 'Baker's Dozen' of Dodecanese Islands in the Aegean."

Bulletin No. 4, October 11, 1943.

Arnold Genthe

FOR CENTURIES ON RHODES A MAN'S HOME WAS HIS FORTRESS

The stout walls of the houses, the small barred windows in deep recesses, the heavy Gothic doors are reminders that for hundreds of years whoever lived in Rhodes had to be prepared to defend his household against attack. A way station on the voyage of Christian pilgrims to the Holy Land, Rhodes was constantly in peril from the Turks, who finally took the island in 1522. Italian forces occupied it during the Italo-Turkish War in 1912. This year the German garrison on the island seized control when Italy surrendered.

What are these stuffs called explosives that have remodeled warfare into a fiercer, more impersonal, and more destructive pattern?

Unhappy Chemicals the Cause of It All

They mark man's closest approach to "black magic." In the form of innocent-looking black or brown powders, grains, or jellies, they put nature's most violent forces at his command for constructive or destructive use.

U. S. Navy, Official

TWIN EXPLOSIONS BOOM FROM ASH CANS FULL OF FIRE

The Navy calls it an "ash can" because of the size and shape of the explosive's container, but the depth charge is all fire and no ashes. It is an underwater "bomb" for use against submarines, designed to set itself off at a given depth such as 50 feet under water. It is thrown from the stern of a vessel by a catapult-type projector. Two may be thrown simultaneously for a double-barreled explosion (above). When set off, every particle of explosive suddenly becomes a one-molecule volcano, blowing itself up into a large volume of hot gas. The sum of millions of these miniature cataclysms creates the big explosion. Even if not hit, a near-by submarine will be disabled by having its joints jolted apart and its instruments smashed.

Explosives explode because they are chemically discontented. The ingredients of which they are made are normally gases. They are virtually rammed into solid, liquid, or jelly forms like jacks-in-boxes. They are ready, on the least excuse, to jump out into their gaseous forms again. The excuse, furnished by fuses or detonators, is a sudden, powerful jolt. Then each solid particle in the mass of explosive is transformed—in a fraction of a second—into a great blast of gas.

Molecules Go Boom

The gas occupies a vastly greater space than the particle did—in the case of nitroglycerine (dynamite), more than 8,000 times as great. This means that one cubic inch of the explosive expands into more than 4½ cubic feet of hot raging gases. In effect, every invisible molecule of the explosive suddenly creates a miniature but terrifically powerful tempest that blows outward in every direction. These millions of violent little tornadoes, jostling and combining, blow everything near by to bits.

Bulletin No. 5,
October 11, 1943.

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